REMARKS

Claims 1-19 and 29-38 are active. Claims 20-28 are withdrawn subject to a restriction requirement.

Request for Reconsideration of Restriction Requirement

It is respectfully requested that the propriety of the restriction requirement be reconsidered. The Examiner's attention is respectfully directed to currently active claim 19. This is a "linking claim" to the configurable transmitter resource of at least the withdrawn claims 20-23 and also, more broadly, to the other withdrawn claims 24-28. It is requested that the restriction requirement be withdrawn and that an examination on the merits of all of the claims be made.

The Office Action is responded to using the same paragraph numbers, in somewhat different order.

9. The allowability of claims 13-15, 19 and 31-35 is noted. These claims currently are not rewritten in the form needed to make then allowable.

Independent claim 1, from which allowable claims 13-15 ultimately depend, and independent claim 29, from which allowable claims 31-35 ultimately depend, are amended in this response. Applicants reserve the right, at a later date, to place the claims indicated to contain allowable subject matter in allowable format in the form present at the time of the Office Action of June 17, 2005.

3. Claims 29-30 and 36 are rejected as anticipated by Smith, et al., U.S. 6,006,075.

The subject application relates to an electronic device that has a plurality of transmitter resources, which can be either hardware or software. There also are a plurality of antenna (antennae) resources. The object of the invention is to permit the selection of one of the plurality of transmitter resources to be made available for transmission by one of the antennae resources.

Transmitter resources, such as used in a communication transceiver, are utilized by various communication protocols. These resources perform functions such as assembling data, scale its power, scramble data, and modulate the data onto a carrier signal.

Within a given communication protocol, a number of different channel formats can be designed for communication between devices. For example, in some communication protocols over fifty different types of channel formats are utilized to communicate the data, control, and status information between multiple communication devices, e.g., transceivers. However, if these different channel formats are implemented on transmitter hardware that is unique to the format of only a given (one) channel, or class of channel, such transmitter may not be compatible to process other channel formats.

Because of the different channel formats, transmitter resources unique to some channel formats may frequently sit idle while transmitter hardware for other types of channel formats is totally consumed. Thus, there may be a mismatch in the quantity of transmitter resources designed for the different channel formats, and the quantity of transmitter resources needed in actual use. For example, too many resources may be designed for voice channels, while there may be insufficient resources designed for pilot channels. This mismatch can translate into a capacity-limiting factor for a communication device due to a shortage of resources for one or more types of channel format.

The present invention overcomes the potential mismatch between transmitter resources designed for a specific channel format and the changing transmitter resource demand in a given communication device. The present invention provides a method and apparatus that overcomes the limitations associated with the varied hardware, software and methodology of transmitting digital signals that are unique and incompatible between each of the various communication protocols. This provides the capability of forward compatibility of communication devices associated with incremental improvements in communication protocols.

The invention also overcomes the potential mismatch between transmitter resources designed for a specific channel format and the changing transmitter resource demand in a given communication device. It also overcomes the limitations of fixed interfaces between transmitter resources and antenna resources and the limitations of a cross bar switch in selectively coupling transmitter resources to antenna resources.

As now set forth in amended claim 29, there are a plurality of transmitter resources that operate with at least one antenna. The transmitter resources are now defined as each being able to perform at least one function of a communication protocol. There also is an enabling signal provided from a computer readable memory to select only one of the transmitter resources for driving a given antenna. Operating information is provided to operate only the transmitter resource driving the given antenna.

Smith is directed to a transmission system designed to achieve both space diversity and frequency diversity in the transmission of an applied RF signal. As shown in Fig. 4 (see column 6, line 56 et seq.) the RF signal from a source 14 is applied to a baseband switch 84 operated by a controller 32 to apply an information signal from the source 14 to a plurality of single frequency transmitters 18. Each single frequency transmitter 18 transmits one frequency.

The outputs all of the single frequency transmitters 18 are applied to an RF switch 24 whose output is to a plurality of spatially separated antennae 25. The RF switch 24 is operated by the controller 32 that is programmed to determine which of the plurality of transmitters 18 (different single frequency) will have its output applied to a selected one of the plurality of antennas and for what period of time. The operation of the RF baseband switch 84 achieves frequency diversity and operation of the RF switch 24 selects an antenna 26 to achieve space diversity.

In making the rejection, the Examiner considers one of the single frequency transmitters 18 of Smith to correspond to the originally claimed "at least one transmitter resource". Claim 29 now calls for a plurality of transmitter resources and the selection of one of these to drive a given antenna. The claim also more specifically defines a transmitter resource as a resource that can perform the function of a communication protocol.

As should be clear from the Specification, and as discussed above, a transmitter resource as set forth in claim 29 is quite different from a single frequency transmitter (18 of Smith), which transmits only a part of an original RF signal. In the present invention, the transmitter resource is a part of the transmitter and can be either of hardware or software.

The transmitter resource functional capability can be transmitted in a digital designated signal format. That is, a transmitter resource is a functional component that can be used to perform and link to other functions. It is not merely a single frequency taken from an applied RF signal as disclosed in Smith.

The subject invention permits forward and backward capability of an electronic device, such as a communication transceiver, by being able to transmit the transmitter resource, e.g., complete operating code, channel codes, etc. This is totally different from operating a single frequency transmitter to achieve frequency and space diversity of an input RF signal, as in Smith.

Accordingly, claim 29 is clearly patentable over Smith and should be allowed. Claims 30 and 36, which depend from claim 29 and recite further features of the inventive subject matter of claim 29, also should be allowable.

4.-5. Claims 1, 2, 4-12, 16 and 38 are rejected over Smith in view of Westall, et al., U.S. 6,718,161.

Each of independent claim 1, from which claims 2, 4-12 and 16 depend, and independent claim 38 recites a plurality of transmitter resources for generating transmission signals. These claims also have been amended to define the resource as being related to a communication protocol. As discussed above, the single frequency transmitter 18 of Smith, used to provide frequency spreading of an input RF signal, is not the same as the claimed transmitter resource of the invention. Thus, Smith clearly does not teach or suggest a plurality of transmitter resources.

Claim 1 also recites an output bus to which the transmission signals of the plurality of transmission resources are applied and an antenna summer coupled to the bus for storing the transmission signals. The RF switch 34 of Smith is not a "bus" as the term is conventionally used. It is a switch that has only one output. This provides an additional structural and functional distinction over Smith.

Westall is added to Smith for the teaching of an antenna summer. Westall is directed to a satellite transmitter for transmission of packet data to targeted spaced receivers. In Westall, the processor 32 queues the packets and selectively arbitrates their

routing to the individual transmitters 34 so that multiple transmitters will not "point and shoot" at the same target coverage area (see column 5, lines 25-37).

In Smith, the antennas 44 do not need to be, and apparently are not, of the directional type as in Westall. Also, there appears to be no need in Smith for an antenna summer, since the purpose of Smith is to produce a continuous output of the input signal 14 but in diversified (frequency and space) form to prevent multi-path interference. There is no need for an antenna summer. Accordingly, the combination of Smith and Westall would appear to be improper.

In the present invention, the antenna summer has a unique advantage in that it is connected to the output bus and stores the signals on the output bus. This provides flexibility of transmitting the signals corresponding to a transmission resource.

Accordingly, the principal reference to Smith fails in not teaching the plurality of transmitter resources and the output bus as set forth in claim 1. The addition of Westall does not cure this defect. Also, the combination of Smith and Westall is not proper.

Independent claim 38 also calls for the plurality of transmitter resources for generating transmission signals and the combination of Westall and Smith do not have this basic feature. Accordingly, claims 1, 2, 4-12 and 16 and 38 are patentable and should be allowed.

6. Claim 3 is rejected over Smith (patent number here incorrectly listed by the Examiner) in view of Miyahara, U.S. 6,449,469.

Claim 3 depends from claim 1 and further recites that the antenna summer includes a plurality of memory buffers that form a ping-pong buffer system. Miyahara is cited for the latter feature. The addition of Miyahara to Smith does not cure the basic defect of Smith for the reasons discussed above with respect to claim 1. Also, the combination of Miyahara with Smith appears to be illogical since Smith does not teach the need for, and most probably does not need, any type of a summer buffer.

Accordingly, claim 3 patentably distinguishes over the applied art and should be allowed.

7. Claims 17 and 37 are rejected over Smith in view of Rostoker, et al., U.S. 6,111,863. Claim 17 depends from claim 1 and claim 37 depends from claim 29. These two dependent claims each further sets forth that the plurality of transmitter resources, now more specifically defined in the independent claims, used with an antenna array is less in number than the number of antennae in the array. Rostoker is relied on for the latter feature.

The addition of Rostoker to Smith does not cure the basic defect of Smith, as discussed above with respect to the independent claims 1 and 29. Also, the combination of references appears to be illogical since there is no reason given as to why one would use different numbers (more or less) of the single frequency transmitters 18 in Smith with different numbers of antenna 44. The degree of space and frequency diversity achieved by Smith appears to be directly related to the number of transmitters and antennae. Accordingly, claims 17 and 37 are also patentable and should be allowed.

8. Claim 18, which depends from claim 1, is rejected over Smith in view of Yuzawa, U.S. 2001/0,001,611, the latter being cited for its teaching of the claimed feature of the worst case load of a number of transmitter resources needed for any single antenna within a group of antennae. As discussed above, the principal reference to Smith fails to meet the claimed subject matter of parent claim 1. Again, it appears that Smith needs all of his transmitters and antennae to achieve the degree of space frequency and space diversity that he desires. Accordingly, claim 18 also is patentable and should be allowed.

In view of the above amendment, applicant believes the pending application is in condition for allowance.

Prompt and favorable action is respectfully requested.

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